

IN THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

1. (CURRENTLY AMENDED) A DNA chip, comprising:
 - a flat carrier; and
 - an array of spots containing catcher molecules, each spot being assigned a microelectrode arrangement for detecting binding events between the catcher molecules and target molecules applied via an analyte solution, the microelectrode arrangement being at least partially embedded in a hydrophilic reaction layer which is permeable to target molecules and in which immobilized catcher molecules are distributed three-dimensionally,
 - the hydrophilic reaction layer having a thickness approximately in the range of $1L$ to $5L$, L being the sum of electrode width and electrode spacing, the electrode width and the electrode spacing being approximately $1\mu\text{m}$ [[,]]
~~the hydrophilic reaction layer having a thickness between $2\mu\text{m}$ and $10\mu\text{m}$, and~~
~~the hydrophilic reaction layer being a hydrogel internally cross-linked by a cross-linking agent.~~
- 2.-4. (CANCELLED)
5. (CURRENTLY AMENDED) The DNA chip as claimed in claim 1, wherein the microelectrode arrangement is a two-pole system, and wherein the hydrophilic reaction layer has a thickness of approximately $3\mu\text{m}$.
6. (CURRENTLY AMENDED) The DNA chip as claimed in claim 1, wherein the microelectrode arrangement is a four-pole system, and wherein the hydrophilic reaction layer has a thickness of approximately $7\mu\text{m}$.
7. (CURRENTLY AMENDED) The DNA chip as claimed in claim 1, wherein the hydrophilic reaction layer is thermally stable up to approximately 95°C .

8. (CURRENTLY AMENDED) The DNA chip as claimed in claim 1, wherein the hydrophilic reaction layer contains coupling groups for the covalent binding of catcher molecules.

9. (CANCELLED)

10. (PREVIOUSLY PRESENTED) The DNA chip as claimed in claim 6, wherein the hydrophilic reaction layer is an acrylamide-based radical-crosslinkable hydrogel including at least one of maleic anhydride and glycidyl (meth)acrylate as coupling groups.

11. (CURRENTLY AMENDED) The DNA chip as claimed in claim 1, wherein the microelectrode arrangement is an interdigital electrode arrangement.

12. (PREVIOUSLY PRESENTED) The DNA chip as claimed in claim 11, wherein the interdigital electrode arrangement is a two-pole microelectrode system.

13. (PREVIOUSLY PRESENTED) The DNA chip as claimed in claim 11, wherein the interdigital electrode arrangement is a four-pole microelectrode system.

14. (CURRENTLY AMENDED) The DNA chip as claimed in claim 1, wherein the flat carrier includes a semiconductor layer and an insulating layer connected thereto, the insulating layer carrying the microelectrode arrangement and the hydrophilic reaction layer on its side remote from the semiconductor layer.

15. (PREVIOUSLY PRESENTED) The DNA chip as claimed in claim 14, wherein the semiconductor layer is a silicon layer.

16.-20. (CANCELLED)

21. (CURRENTLY AMENDED) The DNA chip as claimed in claim 1, wherein the hydrophilic reaction layer comprises a hydrogel containing a [[the]] cross-linking agent is-methylene bisacrylamide.

22. (CURRENTLY AMENDED) The DNA chip as claimed in claim [[1]] 21, wherein the cross-linking agent is a dimethylacrylate or methylene bisacrylamide.
23. (PREVIOUSLY PRESENTED) The DNA chip as claimed in claim 22, wherein the dimethylacrylate is tetraethylene glycol dimethylacrylate.
24. (CURRENTLY AMENDED) The DNA chip as claimed in claim [[1]] 21, wherein the hydrophilic reaction layer is thermally cross-linked by the cross-linking agent.
25. (CURRENTLY AMENDED) The DNA chip as claimed in claim [[1]] 21, wherein the hydrophilic reaction layer is photo-cross-linked by the cross-linking agent.

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END OF CLAIM LISTING